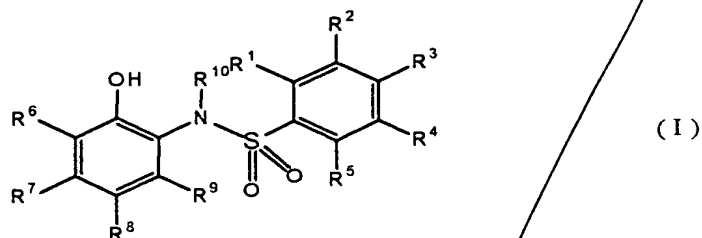


CLAIMS

1. An electron-accepting compound having the general formula (I),



wherein each of R^1 to R^9 respectively represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, arbitrary two groups selected from R^1 to R^5 may bond to each other to form a ring, arbitrary two groups selected from R^6 to R^9 may bond to each other to form a ring, and R^{10} represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms.

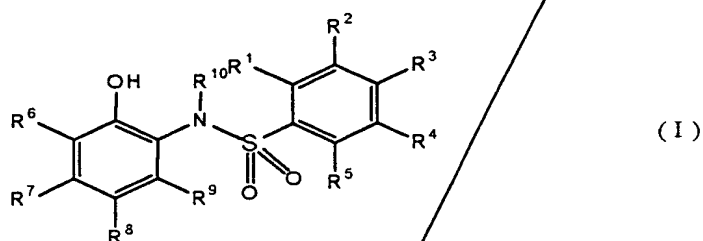
2. The electron-accepting compound of claim 1, wherein all of R^6 to R^{10} in the general formula (I) are hydrogen atoms.

3. The electron-accepting compound of claim 2, which is N-(2-hydroxyphenyl)-p-toluenesulfonamide or N-(2-hydroxyphenyl)benzenesulfonamide represented by the general formula (I).

4. An electron-accepting compound which is N,N'-bis(2-hydroxyphenyl)-4,4'-biphenyldisulfonamide.

5. A heat-sensitive recording material having a

substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains at least one member selected from the electron-accepting compound of the general formula (I),



in which each of R^1 to R^9 respectively represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, arbitrary two groups selected from R^1 to R^5 may bond to each other to form a ring, arbitrary two groups selected from R^6 to R^9 may bond to each other to form a ring, and R^{10} represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, or N,N'-bis(2-hydroxyphenyl)-4,4'-biphenyldisulfonamide.

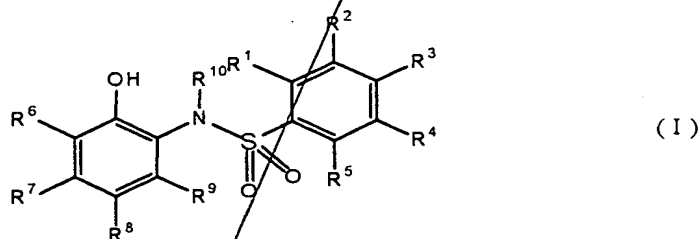
6. The heat-sensitive recording material of claim 5, wherein the heat-sensitive recording layer further contains at least one electron-accepting compound selected from a diphenylmethane derivative, a benzoic acid derivative, a salicylic acid derivative or a urea derivative.

7. The heat-sensitive recording material of claim 5

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W1
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or 6, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

8. A heat-sensitive recording material having an undercoat layer containing a pigment and an adhesive as main components and a heat-sensitive recording layer on a substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, or the heat-sensitive recording material optionally further having at least one protective layer on the heat-sensitive recording layer, wherein said heat-sensitive recording layer contains at least one member selected from benzenesulfonamide derivatives of the general formula (I),



in which each of R^1 to R^9 respectively represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, arbitrary two groups selected from R^1 to R^5 may bond to each other to form a ring, arbitrary two groups selected from R^6 to R^9 may bond to each other to form a ring, and R^{10} represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, or N,N'-bis(2-hydroxyphenyl)-4,4'-biphenyldisulfonamide.

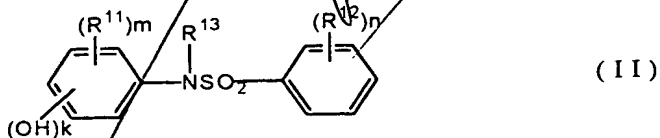
9. The heat-sensitive recording material of claim 8, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

10. The heat-sensitive recording material of claim 8 or 9, wherein the pigment contained in the undercoat layer is an oil-absorbing pigment which shows an oil absorption of 70 to 800 ml/100 g when measured according to JIS-K-5101 or organic hollow particles.

11. The heat-sensitive recording material of claim 8, 9 or 10, wherein the protective layer contains at least one selected from an acetoacetyl-modified polyvinyl alcohol, a carboxy-modified polyvinyl alcohol, a diacetone-modified polyvinyl alcohol or a silicon-modified polyvinyl alcohol, and a pigment, as main components.

12. The heat-sensitive recording material of any one of claims 8 to 11, wherein the heat-sensitive recording layer, the protective layer or both contain a benzotriazole-containing ultraviolet absorbent.

13. A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains at least two members selected from benzenesulfonamide derivatives of the general formula (II),



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4B
R3

wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2.

14. The heat-sensitive recording material of claim 13, wherein the heat-sensitive recording layer contains a mixture prepared by mixing at least two members selected from benzenesulfonamide derivatives of the general formula (II) on a molecular level.

15. The heat-sensitive recording material of claim 13 or 14, wherein the mixture contains two members of the benzenesulfonamide derivatives, which are used together in a mixing weight ratio of from 1:9 to 9:1.

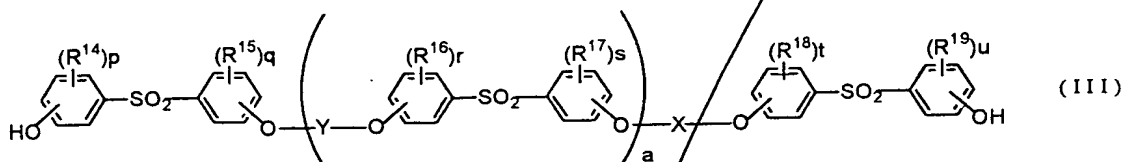
16. The heat-sensitive recording material of claim 13, 14 or 15, wherein the benzenesulfonamide derivatives are a combination of N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide.

17. The heat-sensitive recording material of any one of claims 13 to 16, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

18. A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive

recording layer contains a benzenesulfonamide derivative and a diphenylsulfonamide derivative.

19. The heat-sensitive recording material of claim 18, wherein the diphenylsulfone derivative is a compound of the general formula (III),

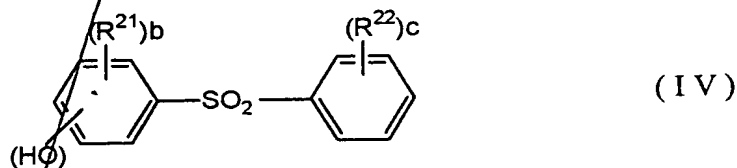


wherein X and Y may be the same or different, each represents a linear or branched divalent hydrocarbon group which has 1 to 12 carbon atoms and may have a saturated or unsaturated ether bond, or a group represented by



in which R^{20} is a methylene group or an ethylene group and T is a hydrogen or an alkyl group having 1 to 4 carbon atoms, each of R^{14} to R^{19} independently represents a halogen atom, an alkyl group or an alkenyl group, each of p, q, r, s, t and u is an integer of 0 to 4, respectively, provided that when they are 2 or more, those represented by any one of R^{14} to R^{19} may be the same or different, respectively, and a represents an integer of 1 to 10.

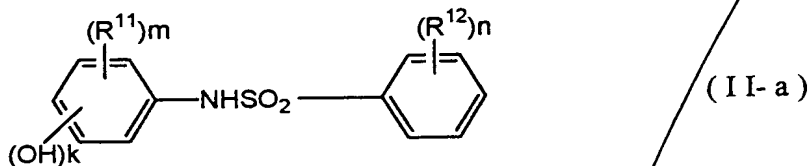
20. The heat-sensitive recording material of claim 18, wherein the diphenylsulfone derivative is a compound of the general formula (IV),



wherein each of R^{21} and R^{22} independently represents a halogen atom, a hydroxyl group, an alkyl group,

an alkenyl group, an aralkyl group, an aryl group, an alkoxy group or a phenylsulfonyl group, b represents an integer of 0 to 4 and c represents an integer of 0 to 5.

- 5 21. The heat-sensitive recording material of claim 18, 19 or 20, wherein the benzenesulfonamide derivative is a compound of the general formula (II-a),



- 10 wherein each of R^{11} and R^{12} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2.
- 15

22. The heat-sensitive recording material of any one of claims 18 to 21, wherein the benzenesulfonamide derivative and the diphenylsulfone derivative are contained in a weight ratio of from 9:1 to 3:7.
- 20

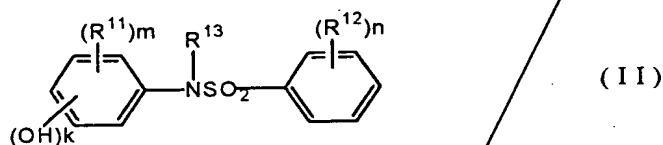
23. The heat-sensitive recording material of any one of claims 18 to 22, wherein the heat-sensitive recording layer contains, as an additive, a hydroxybenzoic acid derivative of the general formula (V),
- 25



- 30 wherein Z is an oxygen atom or -NH group, R^{23} is an alkyl group, an alkenyl group, aralkyl group or an aryl group, and d represents an integer of 1 to 4.

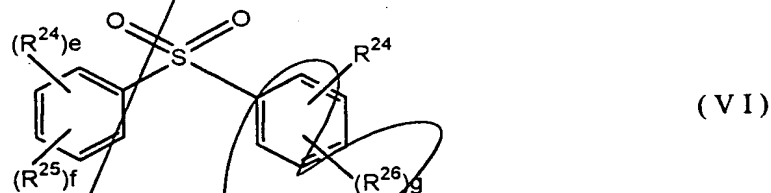
4-3
A4
Cord
24. The heat-sensitive recording material of any one of claims 18 to 23, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

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25. The heat-sensitive recording material of claim 18, wherein the heat-sensitive recording layer contains at least one member selected from benzenesulfonamide derivatives of the general formula (II),

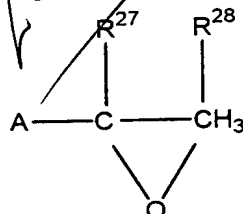


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wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2,

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and also contains at least one member selected from diphenylsulfone derivatives of the general formula (VI),



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wherein R^{24} is a group



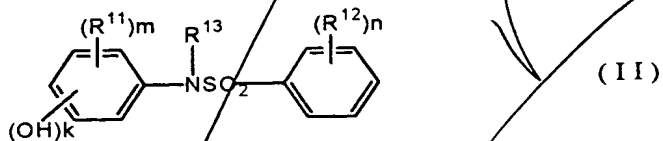
25
in which A represents $-(CH_2)_n-$, $-O(CH_2)_i-$ or $-O(CH_2)_jO(CH_2)_v-$, each of R^{27} and R^{28} respectively represents a hydrogen atom or an alkyl group having 1 to 6 carbon

atoms, each of h and i represents an integer of 0 to 5, and each of j and v represents an integer of 1 to 5, each of R²⁵ and R²⁶ respectively represents a halogen atom, an alkyl group having 1 to 6 carbon atoms, an alkoxyl group having 1 to 6 carbon atoms or a benzyloxy group which may have a substituent, e represents an integer of 0 or 1, f represents an integer of 0 to 5 and g represents an integer of 0 to 4.

26. The heat-sensitive recording material of claim 25, wherein the benzenesulfonamide derivatives are a combination of N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide.

27. The heat-sensitive recording material of claim 25 or 26, wherein the diphenylsulfone derivative is 4-benzyloxy-4'-(2-methylglycidyoxy)diphenylsulfone.

28. A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains at least one member selected from the benzenesulfonamide derivatives of the general formula (II),

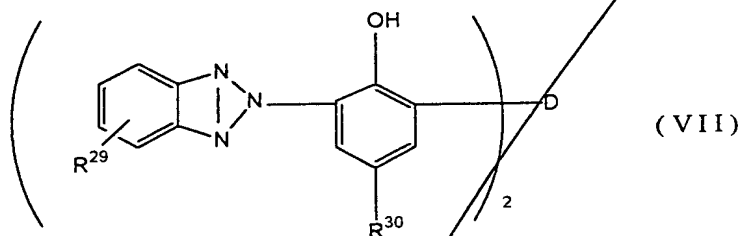


wherein each of R¹¹, R¹² and R¹³ respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group

having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and also contains an ultraviolet absorbent.

29. The heat-sensitive recording material of claim 28, wherein the ultraviolet absorbent is a benzotriazole derivative.

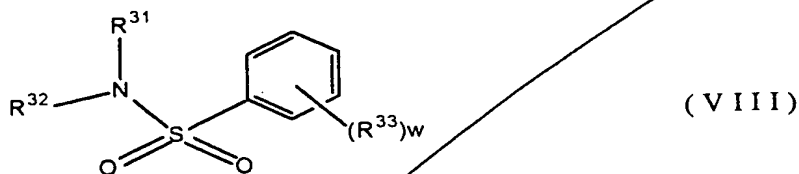
30. The heat-sensitive recording material of claim 28 or 29, wherein the ultraviolet absorbent is a dimer of a benzotriazole derivative of the general formula (VII),



wherein R^{29} represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryl group or an aryloxy group, R^{30} is an alkyl group having 1 to 18 carbon atoms, and D is an alkylidene group having 1 to 8 carbon atoms.

31. The heat-sensitive recording material of claim 28, 29 or 30, wherein the benzenesulfonamide derivative is N-(2-hydroxyphenyl)-p-toluenesulfonamide or N-(4-hydroxyphenyl)-p-toluenesulfonamide.

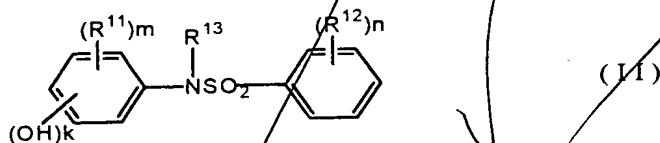
32. The heat-sensitive recording material of any one of claims 28 to 31, wherein the heat-sensitive recording layer contains a compound of the general formula (VIII),



wherein each of R^{31} and R^{32} respectively represents a hydrogen atom, an alkyl group, an aralkyl group or an aryl group, respectively, R^{33} represents an alkyl group, an alkoxyl group, an alkenyl group, an aralkyl group or an aryl group, and w represents an integer of 0 to 5.

33. The heat-sensitive recording material of any one of claims 28 to 32, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

34. A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains at least one member selected from the benzenesulfonamide derivatives of the general formula (II),



wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms,

carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2 is used as the electron-accepting compound.

39. The heat-sensitive recording material of claim 38, wherein at least two benzenesulfonamide derivatives are used in combination.

40. The heat-sensitive recording material of claim 39, wherein the benzenesulfonamide derivatives are a combination of N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide.

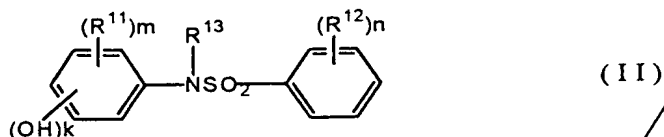
41. The heat-sensitive recording material of claim 38, 39 or 40, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

42. A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said substrate contains a non-wood pulp and at least one selected from a benzenesulfonamide derivative, a diphenylsulfonamide derivative, an benzoic acid derivative or a diphenylmethane derivative is used as the electron-accepting compound.

43. The heat-sensitive recording material of claim 42, wherein the substrate has a non-wood pulp content of at least 10% by weight.

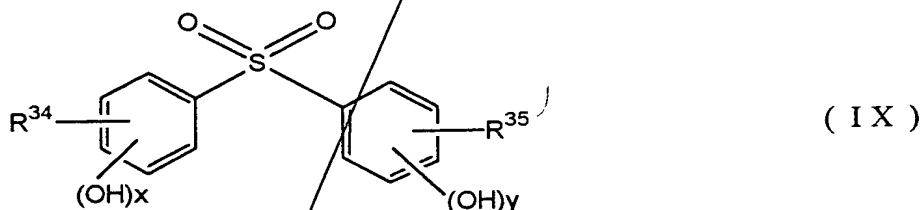
44. The heat-sensitive recording material of claim 42

or 43, wherein the benzenesulfonamide derivative is a compound of the general formula (II),



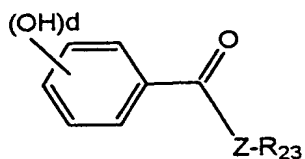
wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2.

45. The heat-sensitive recording material of claim 42 or 43, wherein the diphenylsulfone derivative is a compound of the general formula (IX),



wherein each of R^{34} and R^{35} respectively represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an alkenyl group, an aralkyl group, an aryl group, an alkenyloxy group, an aralkyloxy group or an aryloxy group, x represents an integer of 1 to 3, and y represents an integer of 0 to 2.

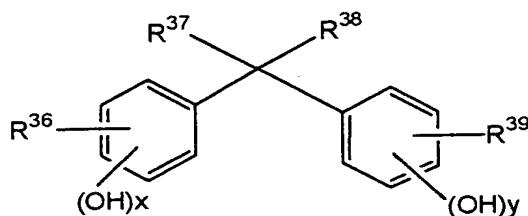
46. The heat-sensitive recording material of claim 42 or 43, wherein the benzoic acid derivative is a compound of the general formula (V),



(V)

wherein Z is an oxygen atom or -NH group, R^{23} is an alkyl group, an alkenyl group, aralkyl group or an aryl group, and d represents an integer of 1 to 4.

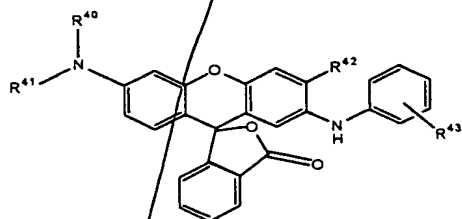
47. The heat-sensitive recording material of claim 42 or 43, wherein the diphenylmethane derivative is a compound of the general formula (X),



(X)

wherein each R^{36} to R^{39} respectively represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an alkenyl group, an aralkyl group, an aryl group, an alkenyloxy group, an aralkyloxy group, an aryloxy group or an alkoxy carbonylalkyl group, R^{37} and R^{38} may bond to each other to form a ring, x represents an integer of 1 to 3, and y represents an integer of 0 to 2.

48. The heat-sensitive recording material of any one of claims 42 to 47, wherein the dye precursor is a xanthene compound of the general formula (XI),



(XI)

wherein each of R^{40} and R^{41} respectively represents an alkyl group, an aryl group or aralkyl group

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and may bond to each other to form a ring, R^{42} represents a hydrogen atom, a halogen atom or an alkyl group, and R^{43} represents a hydrogen atom, a halogen atom, an alkyl group or a halogenated alkyl group.

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